

## BOOK REVIEWS

### Standard Language and a Work in Progress

*INS Dictionary of Neuropsychology*. D.W. Loring (Ed.). 1999. New York: Oxford University Press. 173 pp., \$24.95 (PB).

Reviewed by LINAS A. BIELIAUSKAS, *VA Medical Center and the University of Michigan Health System, Ann Arbor, Michigan*

Compiling a dictionary is a formidable undertaking. Noah Webster published the first American dictionary in 1806 and immediately set about revising it to his formidable *American Dictionary of the English Language* published 22 years later in 1828. The next revision appeared in 1840. These timelines provide some estimate of the effort involved in such an undertaking.

The *INS Dictionary of Neuropsychology* has taken 12 years to compile from the gleam in the eye of then president Muriel Lezak to the final push by current editor David Loring for completion in 1999. Having witnessed most of this process from its inception, I can attest to the multiple efforts put forth by numerous individuals to achieve the current product. It is almost remarkable that the project was completed at all since, as opposed to Webster, who successfully marketed his dictionaries for sale, the individuals contributing to the *INS dictionary* have done so primarily with little or no remuneration or personal gain. That being said, the dictionary is now a reality.

As the 1999 *INS* president Julia Hannay pointed out in her forward, construction of the *INS dictionary* is necessarily complicated by the fact that *INS* is a multidisciplinary organization. *INS* is also international in nature. Thus, the idiosyncratic jargon peculiar to one discipline or country will not always translate to another, and this shows up in the current text. For example, the *INS dictionary* defines “dyslexia” as a primary reading disability (acknowledging its European variants) while “alexia” is defined as an acquired reading disability. While this agrees with other medical definitions (e.g., Dorland’s, 1994), the same cannot be said for related topics such as “aphasia” and “dysphasia.” The *INS dictionary* defines “aphasia” as “an acquired disorder of symbolic language processing” (p. 15); there is no mention of “dysphasia.” *Dorland’s Medical Dictionary* (1994), on the other hand, distinguishes “aphasia,” “the defect or loss of the power of expression . . .” (p. 105) from “dysphasia,” an “impairment of speech consisting in lack

of coordination and failure to arrange words in their proper order.” Similarly, the *INS dictionary* defines “agraphia” but not “dysgraphia” which Dorland’s (1994) defines as “difficulty in writing” (p. 515). While it is not clear that these distinctions are always meaningful, the fairly common use of both types of words in clinical terminology would suggest that some further clarification would be in order for the *INS text*.

A somewhat more basic increment that might be useful in such an opus would be formal definitions of the field itself. How often are we asked, in forensic or other settings, “What is neuropsychology?” While most of us undoubtedly have definitions we standardly employ, it is somewhat surprising that the word “neuropsychology” itself is not defined in this dictionary. Neither is “Clinical Psychology” or “Neurology.” On the other hand, “speech pathologist” is defined. As the dictionary is a multidisciplinary vehicle, consistency in some of these more generic definitions would be valuable.

Finally, while definitions are available for many wonderful terms, such as “aprosexia—a disturbance of attention and concentration associated with psychomotor inefficiency” (p. 21), there will be others which various of us will find missing, such as “pseudotumor cerebri” or “kwashiorkor.” Of course, the need for such definitions rests with the individual peculiarities of the user, though, as Webster showed with his revised dictionaries, more is better.

Webster’s passion in creating his dictionaries was to make the American language standard and he achieved his aim by making his dictionary the standard reference. It is to be hoped that the *INS Dictionary of Neuropsychology* will become a similar standard for our interdisciplinary field, fostering accurate communication between disciplines and between countries. As with any dictionary, this text is a work in progress and will need to be revised and added to on a regular basis. It is the fondest hope that the *INS* will continue to foster this project and that succeeding revisions will appear with rapidity. Nevertheless, the *INS Dictionary*

already succeeds remarkably in its aim of being a valuable resource to “students, practitioners, and researchers” (Editor’s Preface) and it is highly recommended for the bookshelves of all working in the area of neuropsychology. It is also noted that the dictionary is inexpensive (\$24.95 in paperback) and thus easily available to all interested parties. A common language will foster consensual notions and nour-

ish progress in the development of our field. Bravo for this fine effort.

## REFERENCE

*Dorland’s Illustrated Medical Dictionary*. (1994). Philadelphia: Saunders.

## Imagery From Inside Out, and Outside In

*Imagery*. John T.E. Richardson. 1999. Hove, UK: Psychology Press. 168 pp., \$22.95 (PB).

Reviewed by JENNI A. OGDEN, PH.D., *Associate-Professor of Psychology, Dept. of Psychology, University of Auckland, Private Bag 92019, Auckland, New Zealand.*

John Richardson’s straightforward text on imagery is another book in the series *Cognitive Psychology: A Modular Course* and as such its purpose is to bring together research relevant to the topic of imagery in a format that can be easily understood by undergraduate psychology students. This book will certainly fulfill this purpose, although it may be even more useful for the student at undergraduate or graduate level who wishes to gain an overview or refresher course on imagery research in enough detail to act as a basis for further and more in-depth reading. It may also provide ideas for graduate research projects; imagery seems to lend itself to small projects that can be fairly easily carried out on normal participants with minimal equipment or complex computer programming. As we all have some ability to generate and manipulate mental images, the topic is intrinsically fascinating; we are all keen to know whether we can generate this image or rotate that one. Thus, whilst reading the book, I found myself answering many of the questions given as examples of various imagery questionnaires (am I a visualizer or a verbalizer?), and seeing how vividly I could imagine a daffodil hidden inside the torch held up by the Statue of Liberty. I imagine this adds to the effectiveness of the book; certainly it is effective as a means of holding the reader’s attention.

The book is divided into six chapters, the first being a brief introduction and explanation of how the book is structured. The book’s substance is contained in the middle four chapters, each of which describes a different aspect of imagery research. Chapter 2 begins with the layperson’s view of imagery as a subjective experience, and takes the reader through the rise, fall, and rise again of using verbal accounts of one’s own subjective experience of mental images as a valid (or otherwise) research method to further our understanding of imagery. One of the strengths of the book is that it is liberally sprinkled with examples from actual questionnaires and examples of research stimuli from the past through to current research. For example, Galton’s “breakfast-table questionnaire” on visualizing familiar objects, published in 1883, is reproduced in full on p. 11.

Chapter 3 turns to imagery as an internal representation. It summarizes research demonstrating that our spatial abilities are related to the quality of our imagery while performing specific tasks, and that imagined objects can be manipulated along physical and abstract dimensions as if they were physical objects. This chapter is particularly strong in its review of the literature on research using the assessment of brain damaged patients as a means of exploring both the cognitive and neural bases of imagery. For example, the research on unilateral neglect of representational space, popular in the late 1970s to 1980s (e.g., Bisiach & Luzzatti, 1978) is described, as is research using split-brain patients demonstrating that the left hemisphere is capable of imagery. The development of Kosslyn’s model linking visual perception and visual imagery is described, including the idea that there is a visual buffer or scratchpad in the posterior cortex where we “view” recalled or constructed visual images.

Chapter 4 travels outside the mind of the research participant and concentrates on imagery as a stimulus attribute that can be manipulated by the researcher. Paivio’s research in the 1970s on the concreteness or imageability of words is well covered, and again there is a section on research with brain damaged participants. Of particular interest is the research showing that, in contrast to normal participants, patients with closed head injury or Huntington’s disease have difficulty using the imageability of words to enhance their ability to remember the words. Patients with focal damage to either hemisphere do not lose the ability to use the imageability of words to enhance their memory, suggesting that both hemispheres are involved in this skill.

Chapter 5 is the chapter that will be most useful for those readers interested in the improvement or rehabilitation of memory, as it describes the research on imagery as a memory aid, and in what circumstances it is effective. This is the chapter that has the reader checking out their own visualising skills, and trying out some of the mnemonic strategies described. Each chapter ends with a brief summary of the

main points, and the final “conclusion” chapter reviews the essential points made by each of the four main chapters once again.

Overall, this is a short, clearly written, to-the-point review of the main imagery literature, coherently organised according to four different ways of conceptualizing imagery research. This makes it appropriate as a supplementary undergraduate cognitive psychology or neuropsychology text, or as a stimulus for graduate research projects. It does not explore in any depth the various theories it describes, nor does it take a particularly critical approach to the liter-

ature. The interested reader could, however, use the book as a guide to the research articles or imagery questionnaires they would find most pertinent to the aspect of imagery in which they were interested.

## REFERENCES

- Bisiach, E. & Luzzatti, C. (1978). Brain and conscious representation of outside reality. *Cortex*, 14, 129–133.
- Galton, F. (1883). *Inquiries into human faculty and its development*. London: Macmillan.

## A Comprehensive Look at the Brain and (Some) Emotions

*The Brain and Emotion*. Edmund T. Rolls. 1999. Oxford, UK: Oxford University Press. 378 pp., £18.95 (PB).

Reviewed by DEBORAH FEIN, PH.D., *Department of Psychology, University of Connecticut, Storrs, CT 06269-1020*.

The aims of this book are grand indeed. Rolls addresses such questions as, What are emotions? Why do we have emotions? What are the rules by which emotion operates? What are the brain mechanisms of emotion, and how can disorders of emotion be understood? Why does it feel like something to have an emotion? Why is the brain built to have reward, and punishment, systems? How does the brain produce behavior by using reward, and punishment, mechanisms? And in fact he does succeed remarkably well in presenting a synthesis of experimental data to elucidate many of these questions.

Rolls is an Oxford researcher and a leader in the field of neuropsychological research on emotion and related phenomena, to which he has contributed for the past 30 years. This work serves in part as a review of his remarkable body of work, which ranges from human imaging with emotional stimuli to mapping olfactory and taste cortex in primates, from the neurochemistry of reward to neural network modeling, from emotional changes with frontal lobe damage to the neurophysiology of the visual system and cellular mechanisms of thirst—and much more.

The book opens with definitions of basic emotion-related terms and concepts. It has chapters on the neural mechanisms of hunger and thirst, presents a theory about the nature and purpose of emotion, and reviews the anatomy and neurochemistry of emotion pathways and areas that evoke self-stimulation. It then explores the neural basis of sexual reward (about which more later) and presents a theory of consciousness and its relationship to emotion. A last chapter introduces Rolls' and Treves' view on neural network emotion-related learning, which is detailed in a companion volume (Rolls & Treves, 1998).

This synthesis of emotion research is heavy with Rolls' own work but also integrates findings of many other research-

ers. Most of the chapters are both detailed and readable, rich in experimental data but using these data to make clear points, so that the reader can easily follow the thread of his arguments and can choose the degree of experimental detail to read. The book works very well as an integrated whole; arguments flow from earlier points and there is continuity in the viewpoint throughout. A particularly appealing feature of the book is that it is generally written at a high enough level of detail and sophistication to satisfy the professional researcher, and yet Rolls assumes little background for his readers and defines even simple terms and concepts as he goes.

Emotion is viewed by Rolls as an adaptive system that helps to map certain classes of stimuli (rewarding and punishing) onto action systems, and to prioritize selections among actions, depending on the magnitude of the available reinforcers and the motivational state of the organism. Rolls details the way in which adaptive (evolutionary) advantage is gained by such phenomena as attaching reinforcing value to a stimulus late in its sensory processing, and outlines such specifics as how food-specific satiety is advantageous and how it is achieved in the brain. I found particularly interesting the extended discussion of the neural representation of primary *versus* secondary reinforcers, with the latter, surprisingly, proving simpler to specify. Rolls compares his conception of emotion to other conceptions and theories, finding it fundamentally different from the James-Lange conception and that of Damasio (which he regards as neo-James-Langian) but finding his consistent with that of LeDoux. Rolls also presents a novel classification of emotions, based on omission/termination *versus* presentation of positive *versus* negative stimuli so that, for example, rage or grief is associated with termination of a positive stimulus, relief with termination of a negative stimulus, and fear with presentation of a negative stimulus.

In a book that attempts to address such a multitude of major questions, it is perhaps inevitable that some areas are less well covered than others. Human individual differences such as personality and psychopathology and complex human emotions such as guilt are not covered in the same detail as other topics and these sections will not be as useful as others.

Rolls also devotes considerable space to discussing the nature of consciousness and the relationship of subjective phenomena (sensory and emotional qualia or feelings) to consciousness. Consciousness is viewed by Rolls as largely dependent on language; in fact, a *conscious system* is defined as “the ability to have higher-order thoughts” (p. 250); that is, thoughts about thoughts. Furthermore, a “first-order language processor (that might be perfectly competent at language) would not be conscious, in that it could not think about its own or others’ thoughts.” This seems to imply that I am conscious when I think about my own thoughts but not when I think about trees, which doesn’t seem right, but I leave this to the reader to consider. The ways Rolls deals with *qualia* does seem to be unconvincing. He does not directly address the question of how subjective phenomena can arise from brain activity, but claims that it is “more parsimonious to hold that we would be conscious of such sensory, emotional, and motivational *qualia* because they would be being used . . . in this type of (linguistically based) higher-order thought processing” (p. 251). This seems to suggest that when my cat stretches out on his back to be petted, working his paws and gazing at me through half-closed lids, he is not feeling pleasure, and that when he gets a splinter in his paw, he does not feel pain as I do when I get a splinter in my paw. This contradicts the basic notion of emotion as a kind of motivational processing, or it disconnects emotion (which must exist in cats by Rolls’ conception of emotion) from ‘qualia’ in an unnecessary way. But perhaps the subjective experiences of nonlinguistic creatures is fundamentally unknowable.

The speculative chapter on sexual behavior seems out of place in an otherwise scholarly work. Rolls seems to have relinquished his objective, empirical stance in this chapter. It is based almost entirely on a single book by other authors who have a sociobiological perspective on sexual behavior. Among other notions, the views are espoused that there are genes for infidelity which in women are linked to genes for attractiveness (this being defined as being young-looking and thin, thinness being attractive because it is a sign of not being pregnant), and that the purpose of the penile groove and of pelvic thrusting is to vacuum out sperm from other males which may have been deposited in the male’s absence. There is no hesitation about generalizing from the sexual behavior of birds or lions to that of humans. No mention is made of cultural influences on sexual behavior or of cultural differences in standards of attractiveness; all is interpreted in simple sociobiological terms. I found this chapter to be uncritical, implausible, and offensive.

Two other features that detracted in a minor way from the enjoyableness of the book were the organization of the chapters (it was not clear why the author separated highly specific chapters on thirst and hunger with chapters on the nature and neural bases of emotion) and the index, which was so skimpy as not to be useful.

Despite the theoretical points with which one could take issue, and the chapter on sexual behavior, which is worth reading only for its shock value, the book as a whole presents a clear and plausible point of view, backed up by a highly specific and comprehensive review of experimental work. It is highly recommended for anyone interested in the neural basis of emotion, and is essential for students of this field.

## REFERENCE

Rolls, E. & Treves, A. (1998). *Neural networks and brain function*. Oxford, UK: Oxford University Press.

## Clinicians Take Note: Tables for Your Shelf

*Practitioner’s Guide to Evaluating Change with Neuropsychological Assessment Instruments*. R.J. McCaffrey, K. Duff, and H.J. Westervelt (Eds.). 2000. New York: Kluwer Academic/Plenum. 551 pp., \$69.95 (PB).

Reviewed by MURIEL D. LEZAK, PH.D., *Dept. of Neurology, Oregon Health Science University, Portland, OR.*

This heroic undertaking, while it is not an exciting read, appears to be a necessary addition to the practicing clinician’s reference shelf—the one that’s within arm’s reach while preparing a report. It is a dazzlingly comprehensive review of the literature, reporting on what looks to be just

about every study involving a repeat examination published between 1970 and 1999.

The tables are organized by test in alphabetical order, beginning with Achievement Tests, concluding with Woodcock Johnson-Revised, and with 73 other tests in between.

Some of the studies simply looked at practice effects; others involved interventions such as temporal lobectomy, medication, or radiotherapy. Where interventions took place, data for each experimental group and the control group are posted separately. For each item (e.g., Category Test [error rate] from a 1981 study; digit span forward [22 items listed from 6 studies of medication effects]) the authors report the group (e.g., *control, liver disease*), number of subjects, their

sex and mean age (with *SD* as possible), the type of intervention if any, retest interval, Time 1 and Time 2 mean scores (with *SD* when given), and the reference. Thus these tables should be the answer to most questions about practice effects, many questions about treatment effects, and should continue to raise questions about the value, appropriateness, and meaningfulness of test reliability when examining brain impaired patients.

## The Genetics of Neurobehavioral Manifestation: Linkages and Prospects

*Handbook of Neurodevelopmental and Genetic Disorders in Children.* S. Goldstein and C.R. Reynolds (Eds.). 1999. New York: The Guilford Press. 602 pp., \$65.00 (HB).

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While genetic linkages to a variety of disorders have been suspected for decades, it has only been relatively recently that these linkages have come to be understood to a greater degree. The search for the genetic basis of some neurodevelopmental disorders, such as learning disabilities, has been elusive and fraught with complex hurdles, the genetic basis of other neurodevelopmental disorders, such as Down syndrome, has been much more clear. Other childhood disorders, such as Turner syndrome and fragile X syndrome, also documented clearly defined genotypes. Even when a clear genetic contribution is known (i.e., the genotype), the exact neurobehavioral manifestations (i.e., the phenotypes) remain unclear or poorly documented for many disorders. This edited volume addresses this quest and, perhaps, provides one of the most comprehensive descriptions of the available literature in the interface between genetics and behavior in childhood. As noted by the editors, one of the major objectives of this text is to provide students, clinicians, and researchers with a working knowledge base of behavioral genetics. In this regard, the editors wanted to provide a comprehensive text that was “organized in a framework that is understandable and immediately useful in clinical practice” (p. 6).

This text is divided into three major parts. Part I contains five chapters and addresses basic principles and applications. These chapters span a wide range of topics addressing neuropsychological assessment (Chapter 2), neuroimaging in genetic disorders (Chapter 4), and social ecology (Chapter 5). One key chapter in this section is devoted to behavioral genetics (Chapter 3); this would be “must-reading” for the novice in this field. While the neuropsychological assessment chapter appears rather perfunctory to the experienced clinician, its formulaic approach to assessment and its application to genetic disorders is unique. More novel informa-

tion will be gleaned from the neuroimaging chapter and, especially, the behavioral genetics chapter. This latter chapter is nicely organized and its understanding critical to the text.

Part II contains five chapters dealing with various disorders wherein learning and behavior are primarily affected. These disorders include learning disabilities (Chapter 6), attention-deficit-hyperactivity disorder (Chapter 7), Gilles de la Tourette syndrome (Chapter 8), anxiety disorders (Chapter 9), and autism and other pervasive developmental disorders (Chapter 10). Each of these chapters provides a summary of neurobiological findings within each domain, and available genetics data are offered for most of the chapters. In general, the material contained within each of these chapters should not prove to be unusually novel to the clinician or researcher, and the linkages to behavioral genetics are fleeting.

The final part of this text contains 14 chapters and provides information on specific disorders having “broader-spectrum effects.” Along with Chapter 3, which provided the overview of behavioral genetics, these chapters clearly address the overall mission for this text. Each of these chapters gives an overview of the genetic basis for the disorder(s) and a relatively thorough overview of the neurobehavioral findings associated with each disorder, although the chapter on seizure disorders is relatively weaker in this regard. Issues pertaining to assessment, treatment, and lifespan manifestations are inconsistently addressed across many of these chapters. Following the overall mission of this text, these are chapters that likely will prove to be most useful to the practicing clinician, particularly with respect to definitional issues and topographical features.

This text offers an initial attempt to link the genetic aspects of specific disorders and associated neurocognitive

functioning. The literature integrating these two fields has grown substantially over the past decade. Now that the human genome has been mapped, this text is quite timely.

Typical of such a large edited volume, the chapters vary considerably in their level of presentation and, although generally well written, there appears to be no organizational structure across chapters. The inclusion of increased uniformity across chapters, especially in parts II and III, would have strengthened the text. Further, the text could have been organized better by what is known about the genetic basis for many of the disorders. For example, many of the disorders have a clear genotype, such as Turner syndrome, fragile X syndrome, and Down syndrome, and the study of these disorders already provides direction for examination of genotype–phenotype linkages. How these disorders have been studied, and what has been gained from these studies, could provide direction for investigators studying other disorders with a clear or suspected genotype. Organization of the text around these issues would have been helpful for future studies.

Finally, given the goal of increased integration of the fields of neuropsychology and behavioral genetics, there should have been more effort expended in linking the fields and setting clinical practice and research agendas. Such integration is not an easy enterprise, particularly given the diverse array of professionals practicing in these fields (e.g., molecular biologists, geneticists) and the subsequent “language barriers” that likely will exist, and the amount of new learning needed for all players. A section, or at least a chapter or two, addressing these concerns would have been helpful, particularly with respect to tying their mission to the contents comprising the text.

Despite these concerns, many of the chapters should provide the student, clinician, and researcher with a valuable information resource for specific disorders. This volume should facilitate raising the awareness of the issues pertinent to the genetic basis of many childhood disorders and their associated neurobehavioral manifestations. The editors have met the overall goal for this text in a satisfactory fashion.